

Spiral Galaxies

I. Physical Characteristics

1. Define the term spiral galaxy.

Spiral Galaxy - galaxy with a rotating disc with spiral arms that curve out from a dense central region

2. What is located in each section of a Spiral Galaxy?

Central Bulge : High concentration of stars

Flat, Rotating Disk : Contains stars, gas, + dust

3. How do Spiral Galaxies form?

New stars form in the arms of gas + dust

4. Define the term barred-spiral galaxy.

Barred-Spiral Galaxy - spiral galaxy in which there is a bar structure in the central bulge (extends to where spiral arms start)

5. Spiral Galaxies make up 77 % of all known galaxies.

6. Identify each characteristic of the Milky Way Galaxy.

Type : Barred-Spiral type

Number of Stars : 200 billion stars

Length : 100,000 light years across

Depth : 2,000 light years thick

Sun Location : In spiral arm

Sun Distance From Center : 28,000 light years

7. What is the closest Spiral Galaxy to the Milky Way and oldest discovered Spiral Galaxy?

Closest : Andromeda (2.5 million light years)

Oldest : BX442 (10.7 billion years old)

II. Types Of Spiral Galaxies

1. Identify the locations of each the following Spiral Galaxies.

- Andromeda Galaxy : The Local Group (Milky Way, Andromeda, Triangulum)
- Black Eye Galaxy : Coma Berenices (Berenice's Hair)
- Bode's Galaxy : Ursa Major (The Great Bear)
- Pinwheel Galaxy : Ursa Major (The Great Bear)
- Sombrero Galaxy : Virgo (The Maiden) / Corvus (The Crow)
- Sunflower Galaxy : Canes Venatici (The Hunting Dogs)
- Triangulum Galaxy : Triangulum (The Local Group)
- Whirlpool Galaxy : Canes Venatici (The Hunting Dogs)

III. Spiral Galaxy Discovery

1. How did each of the following advance the understanding of spiral galaxies?

- Democritus : (450-370 B.C.) - Distant stars known as the "Milky Way"
- William Hershel : (1785) - I identified the spiral shape of the Milky Way
- The Great Debate : (1920) Harlow Shapley + Heber Curtis - Galaxies not nebulae of the Milky Way
- Edwin Hubble : (1936) - Developed the Tuning Fork Diagram (progression of galaxies)
- Spitzer Infrared Telescope : (2005) - Confirmed the bar spiral shape of the Milky Way

IV. Spiral Galaxy Existence

1. In what stage of galaxy evolution are Spiral Galaxies?

- Early stage of galaxy formation

2. What is the eventual fate of Spiral Galaxies?

- Develop into elliptical or irregular galaxy (Stars consumed by supermassive black hole)